ASSIGNMENT 4

Textbook Assignment: "Computer Components and Circuits," chapter 4, pages 4-24 through 4-31; and "Central Processing Units and Buses," chapter 5, pages 5-1 through 5-10.

4-1. Which of the following are the types of data elements that can be processed by a computer?

1. Bits and bytes only
2. Bytes and single words only
3. Bits, bytes, and single words only
4. Nibbles, words, double words, bytes, and bits

4-2. What data element is normally the same size as the computer's registers?

1. Bit
2. Nibble
3. Word
4. Double word

4-3. What is the purpose of a computer's power supply?

1. To supply dc voltage
2. To convert ac voltage from a source to useable dc voltage(s)
3. To convert dc voltage(s) from a source to useable ac voltage(s)
4. To supply ac voltage

4-4. Characteristics of a power supply include all of the following except which one?

1. Provide precision voltages
2. Protect the computer from serious damage
3. Supply regulated ac voltages
4. Sense irregular inputs and outputs

4-5. What are the major sections of a computer's power supply?

1. Amplifier, rectifier, filter, and regulator
2. Transformer, generator, filter, and regulator
3. Transformer, rectifier, filter, and regulator
4. Transformer, rectifier, filter, and transmitter

4-6. The computer can only handle one specified input voltage and frequency.

1. True
2. False

4-7. Aboard ship, distribution of computer input power is via which of the following means?

1. Outlets only
2. Load centers only
3. Power panels only
4. Outlets, load centers, and power panels

4-8. Mainframe and minicomputers aboard ship and ashore are preset to only receive the specific input line voltage needed.

1. True
2. False

4-9. Aboard ship, what document provides the specific voltage and frequency values as well as the location of your computer's power?

1. MIL-STD-1399
2. MIL-HDBK-411
3. Ship's electronics doctrine
4. MIL-HDBK-263

4-10. For referencing input power ashore, which of the following documents should you use?

1. MIL-STD-1399, Section 300A
2. MIL-STD-480
3. MIL-HDBK-411
4. Each of the above

4-11. For referencing input power aboard ship, which of the following documents should you use?

1. MIL-STD-1399, Section 300A
2. MIL-STD-480
3. MIL-HDBK-411
4. Each of the above

4-12. Where does the input line voltage go before it is received by the transformer section of the computer's power supply?

1. To the rectifier section
2. To the ON/OFF switch
3. To the blower fan
4. To the filter section

IN ANSWERING QUESTIONS 4-13 THROUGH 4-20, SELECT THE POWER SUPPLY SECTION THAT MATCHES THE CHARACTERISTIC DESCRIBED IN EACH QUESTION.

1. Regulator
2. Rectifier
3. Filter
4. Transformer

4-13. Isolates the power supply from the input line voltage.

4-14. Provides regulated power to additional circuits for further filtering and/or conversion.

4-15. Converts an ac input signal to pulsating dc voltage or ripple.

4-16. Steps up the input line voltage.

4-17. Maintains the output of the power supply at a constant level.

4-18. Provides the necessary power for the bus system terminating resistors.

4-19. Removes pulsating dc ripple and produces a useable dc voltage.

4-20. Provides dc power to the backplane wire harness, and to remote, operator, and maintenance consoles.

4-21. The voltage levels and logic convention for mainframe and minicomputers are identical.

1. True
2. False

4-22. The output of the computer's power supply can be distributed by which of the following sections?

1. Rectifier only
2. Regulator only
3. Both rectifier and regulator
4. Filter

4-23. The power supply must protect the computer from which of the following elements?

1. Incoming power
2. Distributed power
3. Internal cabinet and/or module temperature
4. All of the above

4-24. A power supply will shut off while the computer is running under what condition(s), if any?

1. A low overtemperature condition
2. A high overtemperature condition only
3. A high overtemperature condition and an overcurrent condition
4. None

IN ANSWERING QUESTIONS 4-25 THROUGH 4-31, SELECT FROM THE FOLLOWING LIST THE SIGNAL GENERATED UNDER THE SPECIFIC CONDITION DESCRIBED IN EACH QUESTION.

1. POWER INTERRUPT (PI)
2. MASTER CLEAR (MC), AUTOMATIC
3. STOP

4-25. Used for computer initialization after power has been applied.

4-26. Source power falls below specifications and returns to normal.

4-27. Generates a class I interrupt.

4-28. Logic power goes out of tolerance.

4-29. Source power is lost or the computer cabinet is shut off.

4-30. Generated a specific period after a PI occurs.

4-31. Prevents loss of memory data if logic power is lost faster than normal the turn-off sequence can occur.

4-32. To indicate that power requirements have been met, what digital active signals are generated by a microcomputer's power supply?

1. LEDs only
2. Ac only
3. Dc only
4. Ac and dc

4-33. To provide protection to the computer, which of the following devices are placed in line with the power source?

1. Compensators only
2. Line conditioners only
3. Surge protectors only
4. Compensators, line conditioners, and surge protectors

4-34. Which of the following protective devices provide protection against brownouts?

1. ABTs
2. Surge protectors
3. Line conditioners only
4. Compensators and line conditioners

4-35. Line conditioners can provide all of the following protection except which one?

1. Suppress over-voltage
2. Filter input power
3. Bridge brownouts
4. Provide ac input voltage

4-36. Surge protectors retain their effectiveness with successive surges.

1. True
2. False

4-37. What device allows the computer to execute software during power absences up to 100 ms during transfer of primary power source?

1 .UPS
2. Compensator
3. ABT
4. SPS

4-38. SPSs and UPSs are constructed in much the same way except for which feature?

1. Switching circuitry
2. Power loss is detected
3. Ac line current is sensed
4. Power is transferred from one primary source to another

4-39. What are the three major functional areas of a computer?

1. CPU, I/O, buses
2. CPU, memory, power supply
3. CPU, memory, I/O
4. CPU, I/O, power supply

4-40. Information concerning the logic implementation and interpretation of a specific digital computer would be found in which of the following references?

1. Technical manual
2. Technical manual and MRC
3. MRC only
4. NEETS, Module 13

4-41. Which of the following documents should contain the functional schematics of a digital computer?

1. Technical manual only
2. Owner's manual only
3. Either the technical manual or the owner's manual
4. NEETS, Module 13

4-42. Which of the following references contains the test documentation and procedures, test equipment, and tools required to perform corrective maintenance on a specific computer?

1. Technical manual/owner's manual
2. MRC
3. Ship's electronics equipment doctrine
4. CSOSS documentation

4-43. Which of the following functional areas provide(s) the means for the CPU, memory, and I/O to communicate with each other?

1. System cables
2. System buses
3. System modem
4. Wire bundles

4-44. What two interacting sections compose the CPU?

1. Control and memory
2. ALU and memory
3. Control and ALU
4. ALU and I/O

4-45. All of the following are characteristics of the CPU's control section except which one?

1. Whereto store information and who to talk with
2. How to compute logical solutions
3. When to start and stop
4. What to do

4-46. The control section may provide the computer with the ability to function under which of the following conditions?

1. Manual control only
2. Program control only
3. Manual and program control
4. Interface control

4-47. The control section includes all the following logically designed areas except which one?

1. Timing, and instruction and control
2. Fixed- and floating-point operations
3. Memories-control, cache, and read-only
4. Addressing and interrupts

4-48. What logically designed area in the control section regulates the operation of the computer?

1. Instruction and control
2. Addressing
3. Interrupts
4. Timing

4-49. What type of timing is used for the execution of instructions stored sequentially in memory?

1. Arithmetic timing
2. Synchronous operations
3. Master clock events
4. Asynchronous operations

IN ANSWERING QUESTIONS 4-50 THROUGH 4-55, SELECT FROM THE FOLLOWING LIST THE LOGICALLY DESIGNED AREA THAT PERFORMS THE OPERATION DESCRIBED IN EACH QUESTION.

1. Master clock
2. Main timing chain
3. Main timing signals
4. Timing sequences

4-50. Used to trigger a single-shot to enable and disable circuits in the sequence necessary to execute computer operations.

4-51. Flip-flops are arranged in a ring counter to count master clock phases.

4-52. Used to generate a command enable for sending data from one register to another.

4-53. Taps on a delay line oscillator can be used to provide additional phases.

4-54. Used to issue a series of commands to perform a particular instruction or operation.

4-55. Used to start arithmetic timing and generate command enables used for arithmetic operations.

4-56. To keep track of time intervals, which of the following types of timing circuitry can be used?

1. Monitor clock only
2. Programmable internal timer only
3. Monitor clock and programmable internal timer
4. Real-time clock (RTC)

4-57. To keep track of real time, which of the following timing circuits can be used?

1. RTC only
2. Monitor clock only
3. RTC and monitor clock
4. RTC and programmable interval timer

4-58. Which of the following timing circuits are software/machine instruction controlled?

1. RTC only
2. Monitor clock only
3. Programmable interval timer only
4. RTC, monitor clock, and programmable interval timer

4-59. To channel data inside the computer, what type of circuits are primarily used with registers for instruction and control operations?

1. Analog conversion
2. Data routing circuits
3. Code converter circuits
4. Interface circuits

4-60. A general-purpose register is also known by what name?

1. Instruction
2. Accumulator
3. Program counter
4. Status indicating

4-61. General-purpose registers are generally the same size as the computer's memory word.

1. True
2. False

A. Accumulator
B. Index register
C. Instruction register
D. Program counter
E. Status indicating register

Figure 4A.—Memory type circuits.

IN ANSWERING QUESTIONS 4-62 THROUGH 4-68, SELECT FROM FIGURE 4A THE MEMORY TYPE CIRCUIT THAT APPLIES TO THE FUNCTION DESCRIBED IN EACH QUESTION.

4-62. Used for address modification and counting.

1. A
2. B
3. C
4. D

4-63. Holds the address of the next instruction to be executed.

1. B
2. C
3. D
4. E

4-64. Can be used to indicate the status of operations in the computer.

1. B
2. C
3. D
4. E

4-65. Outputs of this register are translated into commands for CPU execution.

1. B
2. C
3. D
4. E

4-66. Used for temporary storage of data or memory addresses.

1. A
2. B
3. C
4. D

4-67. These registers are used with branching condition instructions to change the sequence of instruction execution.

1. A
2. B
3. D
4. E

4-68. Enables a single instruction to be used to specify a large number of operands indirectly.

1. A
2. B
3. C
4. D

4-69. In the general process of executing a machine instruction, what are the major steps?

1. Write the instruction to memory, update the program counter, translate the instruction, and execute the instruction
2. Encode the instruction, execute the instruction, update the program counter, and read the instruction from memory
3. Increment the instruction register, update the program counter, decode the instruction, and execute the instruction
4. Read the instruction from memory, update the program counter, translate the instruction, and execute the instruction

4-70. Which of the following methods can be used to change the sequence of program execution?

1. Stop and jump switches only
2. Program instructions only
3. Stop and jump switches and program instructions

4-71 Command enables are generated by which of the following parts of the general process of machine instruction execution?

1. Fetch the instruction
2. Update the program counter
3. Translate the instruction
4. Execute the instruction

4-72. The computer executes instructions at two levels or states. Data bits in what register are used to select the instruction operating levels?

1. The index register
2. The program counter
3. The instruction register
4. The status indicating register

4-73. Interrupt processing instructions can be included in which of the following types of programs?

1. Executive function programs
2. Application programs to solve a fire control solution
3. Application programs to compute a sonobuoy pattern
4. Both 2 and 3 above

4-74. Which of the following instructions can only be performed in the executive state?

1. Add instructions
2. Subtract instructions
3. Privileged instructions that are part of interrupts
4. Read instructions

4-75. What is the purpose of instruction operand addressing?

1. To specify the location of the operand
2. To tell when to perform the instruction
3. To tell whereto obtain the instruction
4. To tell how to obtain the memory address of the instruction